

FIG.1

- DATA RECEPTION APPARATUS
- RTP RECEPTION SECTION
- RTCP TRANSMISSION SECTION
- 5 CONTROL INFORMATION TRANSMISSION/RECEPTION SECTION
- SERVER

FIG.2

- DATA RECEPTION APPARATUS
- 10 RTP RECEPTION SECTION
- RTCP TRANSMISSION SECTION
- CONTROL INFORMATION TRANSMISSION/RECEPTION SECTION
- SERVER

15 FIG.3

- 10 DISTRIBUTION SERVER
- 20 WIRED NETWORK
- 30 GATEWAY
- 40 BASE STATION
- 20 50 MOBILE STATION

FIG.4

- COMMUNICATION NETWORK
- TRANSPORT LAYER PROTOCOL
- 25 NETWORK LAYER PROTOCOL

FIG.5

ADAPTIVE CONTROL IN MULTI-MEDIA REAL-TIME COMMUNICATION

60 DETERMINE TRANSMISSION INTERVAL (FIXED INTERVAL OR
TOLERABLE MAXIMUM INTERVAL) OF RECEIVER REPORT PACKET DYNAMICALLY
BETWEEN DATA DISTRIBUTION SERVER AND RECEPTION TERMINAL

5 70 DATA DISTRIBUTION SERVER MONITOR RECEPTION CONDITIONS OF
RECEIVER REPORT PACKET SENT FROM RECEPTION TERMINAL IN UNIT OF
SET TIME INTERVAL

80 COMPARE NUMBER OF TIMES OF FAILED RECEPTIONS OF RECEIVER
REPORT PACKETS WITH ONE OR MORE THRESHOLD(S), AND IN ACCORDANCE

10 WITH THE COMPARISON RESULT, PERFORM ADAPTIVE CONTROL SUCH AS
CHANGING OF DATA TRANSMISSION RATE OR ENDING OF SESSION

END

FIG. 6

15 301 SERVER

302 CONTROL INFORMATION TRANSMISSION/RECEPTION SECTION

303 TCP TRANSMISSION/RECEPTION SECTION

311 COUNTER

310 TIMER

20 305 SENDER REPORT PACKET GENERATION SECTION

307 RTCP TRANSMISSION/RECEPTION SECTION

309 UDP TRANSMISSION/RECEPTION SECTION

306 MEDIA STORAGE SECTION

308 RTP TRANSMISSION SECTION

25 312 TRANSMISSION RATE ADJUSTMENT SECTION

313 SESSION DISCONNECTION SECTION

101 DATA RECEPTION APPARATUS

102 CONTROL INFORMATION TRANSMISSION/RECEPTION SECTION
103 TCP TRANSMISSION/RECEPTION SECTION
104 RECEIVER REPORT TRANSMISSION INTERVAL DETERMINATION
SECTION
5 105 RECEIVER REPORT PACKET GENERATION SECTION
107 RTCP TRANSMISSION/RECEPTION SECTION
109 UDP TRANSMISSION/RECEPTION SECTION
106 MEDIA PLAYBACK SECTION
108 RTP RECEPTION SECTION
10 200 COMMUNICATION NETWORK

FIG.7

DATA RECEPTION APPARATUS
RTP RECEPTION SECTION
15 RTCP TRANSMISSION SECTION
CONTROL INFORMATION TRANSMISSION/RECEPTION SECTION
SERVER
COUNTER=0
COUNTER=1
20 COUNTER=2
TRANSMISSION INTERVAL=TRR-MAX-INT (ms)
TRANSMISSION INTERVAL=TRR-MAX-INT (ms)

FIG.8

25 OPERATION AT SERVER SIDE
ST10001 ACCEPT SETUP REQUEST
ST10002 RECEIVE SET_PARAMETER

trr-max-int=5000

ST10003 ACCEPT PLAYBACK REQUEST, START RTP PACKET TRANSMISSION

ST10004 RECEIVE RECEIVER REPORT PACKET

5 ST10005 SET COUNTER=0

ST10006 START TIMER ($t=0$)

ST10007 RECEIVER REPORT PACKET RECEIVED?

ST10008 $t > trr\text{-}max\text{-}int + \alpha$?

ST10009 INCREMENT COUNTER BY 1

10 ST10010 COUNTER=5?

ST10011 MINIMUM TRANSMISSION RATE?

ST10012 COUNTER=10?

ST10013 REDUCE RTP TRANSMISSION RATE

ST10014 END RTP PACKET TRANSMISSION

15 ST10015 ADJUST TRANSMISSION RATE

FIG.9

RTSP REQUEST FROM DATA RECEPTION APPARATUS TO SERVER

20 FIG.10

RTSP RESPONSE FROM SERVER TO DATA RECEPTION APPARATUS

FIG.11

301 SERVER

25 302 CONTROL INFORMATION TRANSMISSION/RECEPTION SECTION

303 TCP TRANSMISSION/RECEPTION SECTION

304 RECEIVER REPORT TRANSMISSION INTERVAL DETERMINATION

SECTION
311 COUNTER
310 TIMER
305 SENDER REPORT PACKET GENERATION SECTION
5 307 RTCP TRANSMISSION/RECEPTION SECTION
309 UDP TRANSMISSION/RECEPTION SECTION
306 MEDIA STORAGE SECTION
308 RTP TRANSMISSION SECTION
312 TRANSMISSION RATE ADJUSTMENT SECTION
10 313 SESSION DISCONNECTION SECTION
101 DATA RECEPTION APPARATUS
202 CONTROL INFORMATION TRANSMISSION/RECEPTION SECTION
103 TCP TRANSMISSION/RECEPTION SECTION
204 RECEIVER REPORT TRANSMISSION INTERVAL DETERMINATION
15 SECTION
105 RECEIVER REPORT PACKET GENERATION SECTION
107 RTCP TRANSMISSION/RECEPTION SECTION
109 UDP TRANSMISSION/RECEPTION SECTION
106 MEDIA PLAYBACK SECTION
20 108 RTP RECEPTION SECTION
200 COMMUNICATION NETWORK

FIG.12
AUDIO/VIDEO COMMON INFORMATION
25 AUDIO INFORMATION
AUDIO DATA ADDITIONAL INFORMATION ACCORDING TO PRESENT INVENTION
VIDEO INFORMATION

VIDEO DATA ADDITIONAL INFORMATION ACCORDING TO PRESENT INVENTION